- INSPECTION OF SEPTIC SYSTEMS FOR HOME INSPECTORS AND REAL ESTATE PROFESSIONALS

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SUBSURFACE BUREAU

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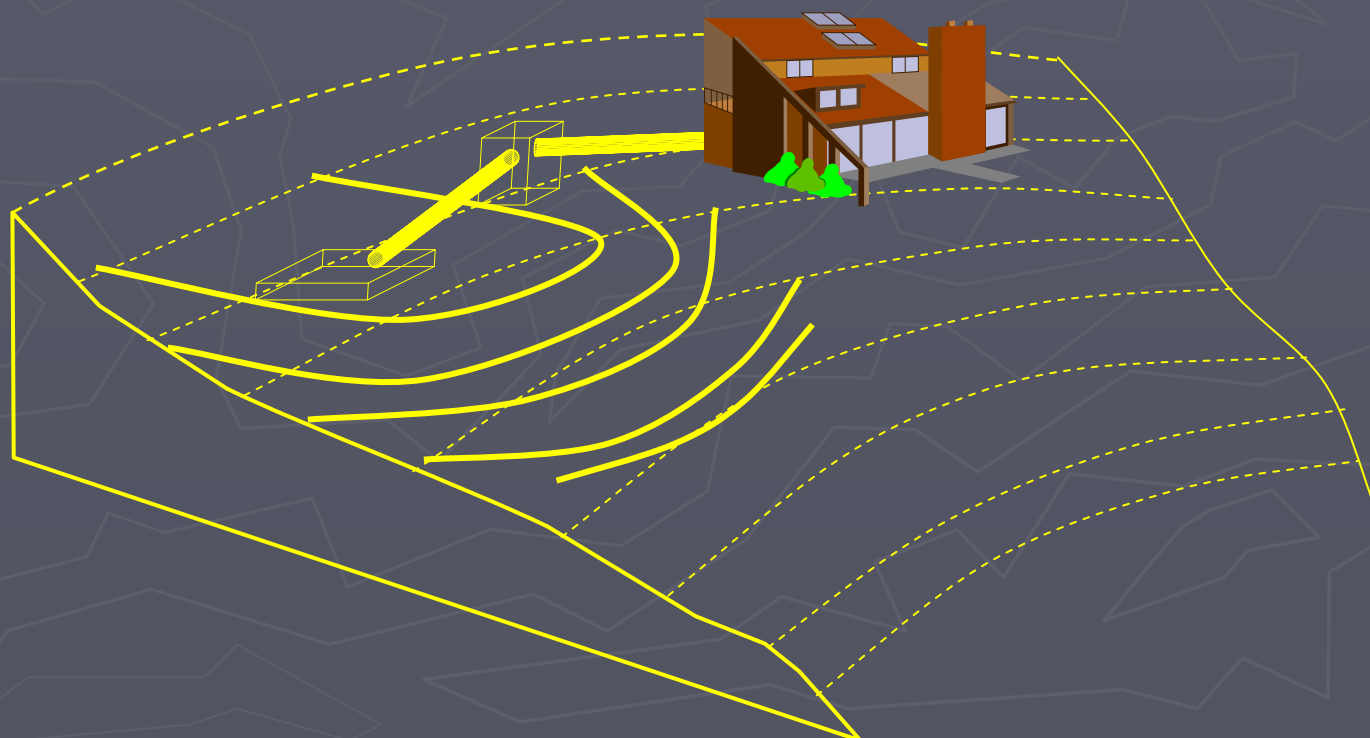
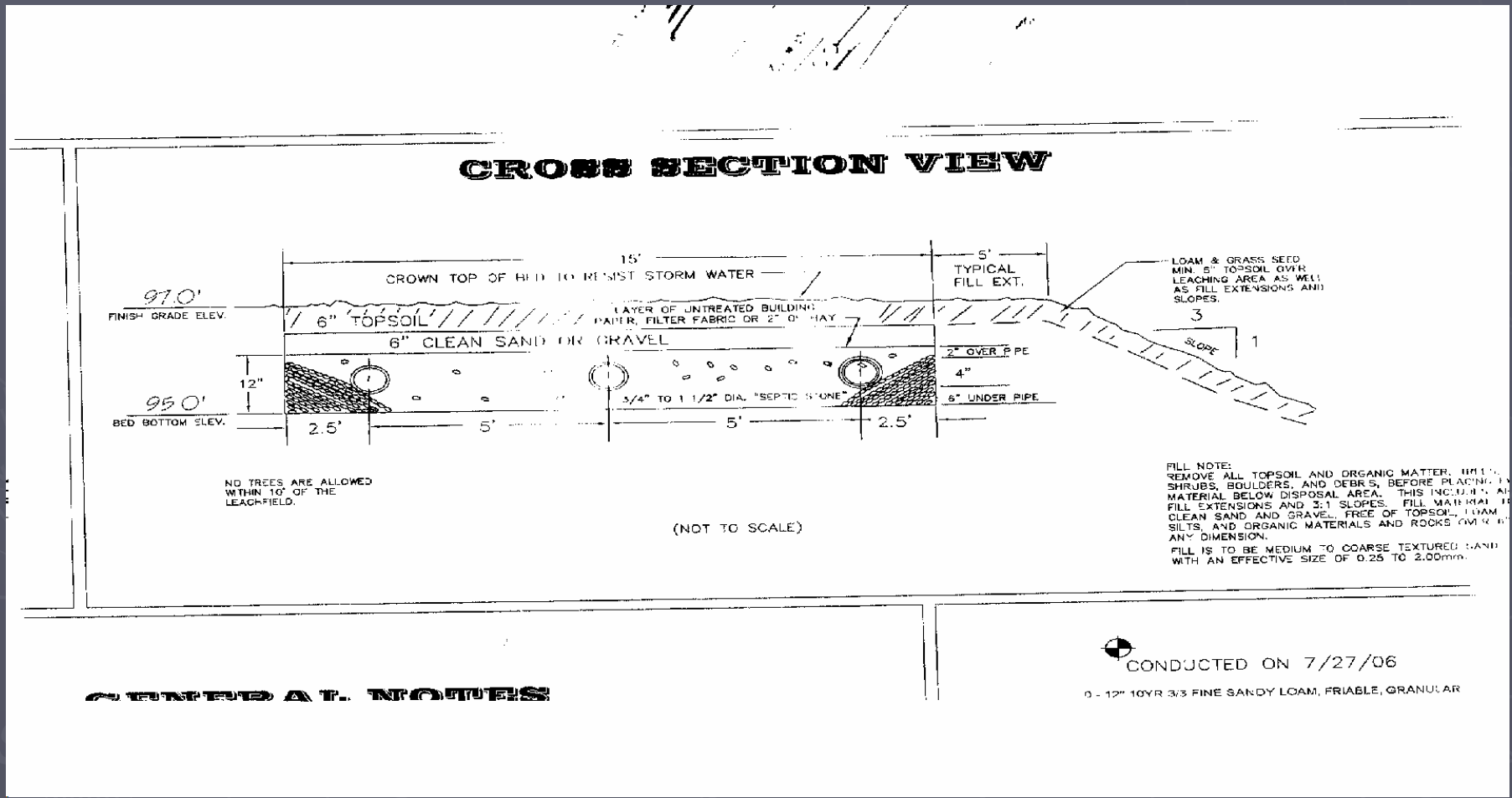
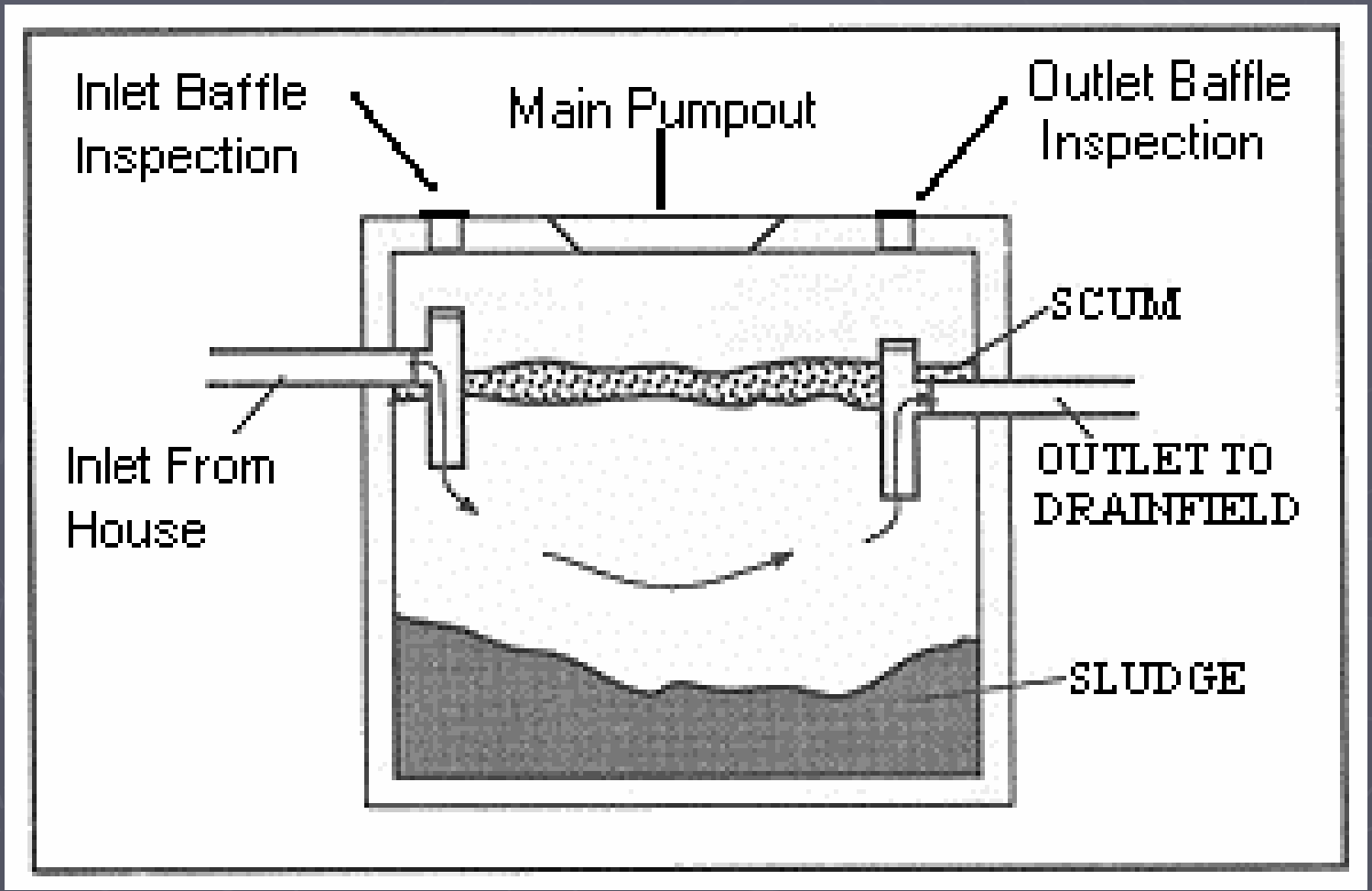
HOW A SEPTIC SYSTEM WORKS



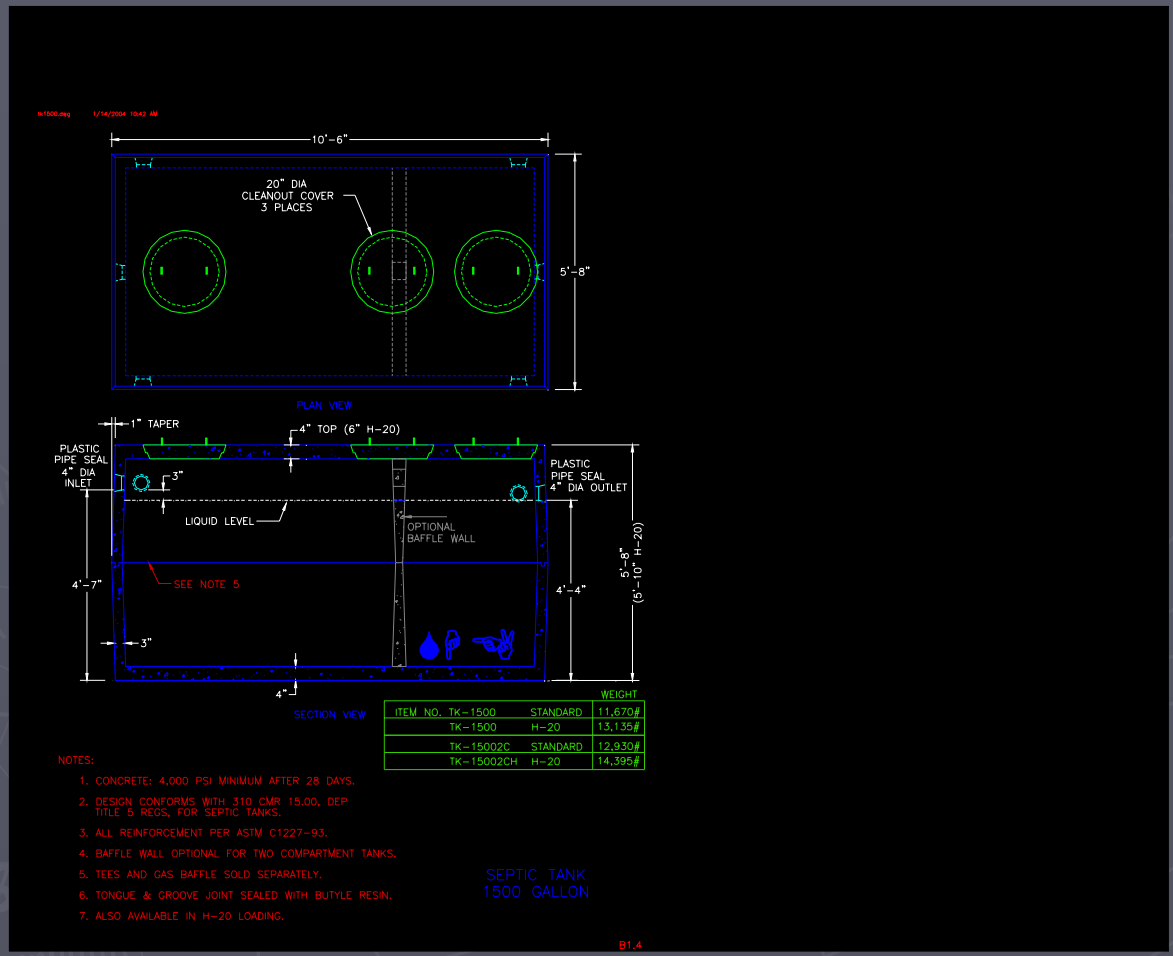
CROSS SECTION



TYPICAL SEPTIC TANK



1500 GALLON SEPTIC TANK



ITEM NO.		WEIGHT
TK-1500	STANDARD	11,670#
TK-1500	H-20	13,135#
TK-15002C	STANDARD	12,930#
TK-15002CH	H-20	14,395#

NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.
3. ALL REINFORCEMENT PER ASTM C1227-93.
4. BAFFLE WALL OPTIONAL FOR TWO COMPARTMENT TANKS.
5. TEES AND GAS BAFFLE SOLD SEPARATELY.
6. TONGUE & GROOVE JOINT SEALED WITH BUTYLE RESIN.
7. ALSO AVAILABLE IN H-20 LOADING.

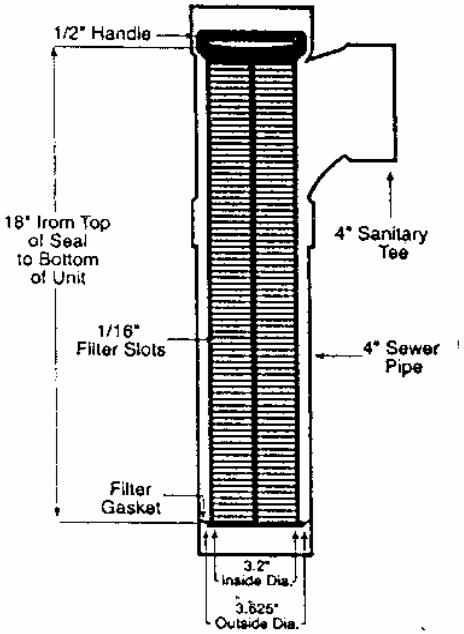
SEPTIC TANK
1500 GALLON

B1.4

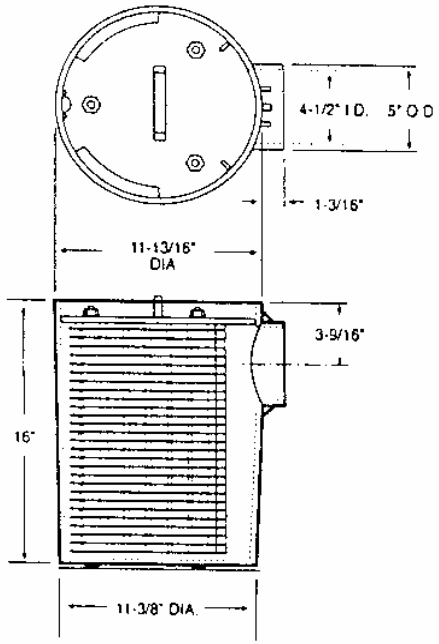
4” TEE AND PIPE IS USED FOR INLET AND OUTLET BAFFLES 40% LIQUID LEVEL

ZABEL FILTERS

ZABEL EFFLUENT FILTERS



A1800



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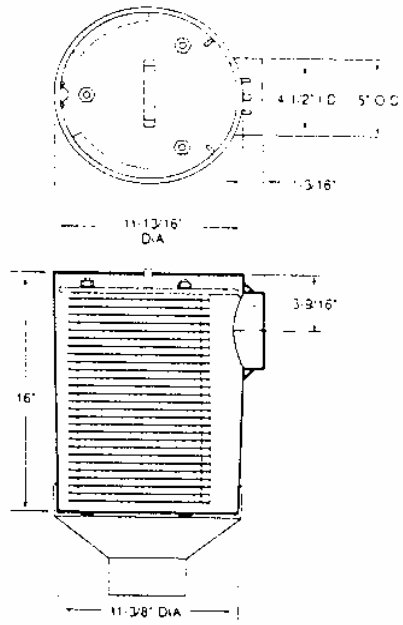
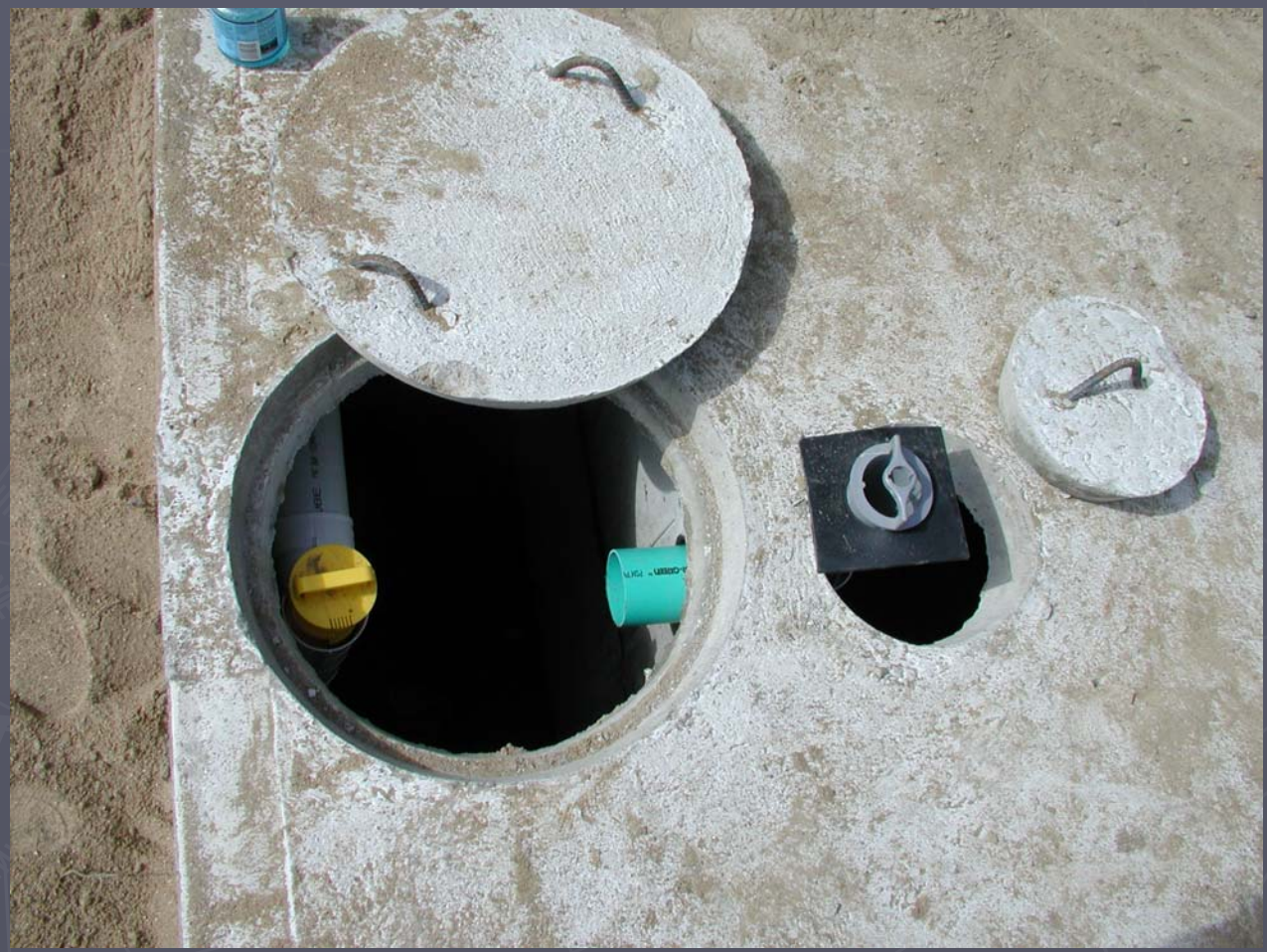


A300

CONCRETE FORM NOT REMOVED
SYSTEM WILL NOT VENT THRU ROOF STACK

PROPER BAFFLES - VENTING

2 COMPARTMENT 2 FILTERS



DISTRIBUTION BOX

- (b) Distribution boxes shall be designed to insure equal distribution of effluent to the several
- lateral lines. The bottom of the outlet lines shall be at the same height within the box.

D box with equalizers

90 or Tee

- Env-Ws 1015.02 Velocity Reducing Devices. Velocity reducing devices such as an elbow or "T"
- shall be installed within the distribution box where the effluent line from the septic tank has a
- slope in excess of 10% or where effluent is being pumped.

PUMP IN OPERATION LARGE D BOX

Fill extension

- Env-Ws 1021.04 Extension of Fill. The finish grade over the bed shall extend for a minimum of
- 5 feet beyond the bed before tapering off to a 3:1 slope. There shall be a minimum of a 3 inch
- layer of loam suitable for seeding and proper stabilization of the slope.

5’ ext. and 3/1 slope

Fill material

- Env-Ws 1021.03 Fill Material. Fill required to raise the effluent disposal area above the seasonal
- high ground water table or impervious substratum shall be clean bank run sand, free of topsoil or
- humus, dredgings, or stones more than 6 inches in any dimension, except that the first 6 inches
- directly beneath the EDA shall consist of:

State sand spec

- (a) Medium to coarse textured sand, with an effective size of 0.25 to 2.0 mm, no greater than 5%
- passing the number 200 sieve, and no particles size larger than 3/4 inch; or
- (b) Materials meeting the ASTM C-33 specification.

CONDUCTING AN INSPECTION

- INFORMATION NEEDED QUESTIONS TO ASK
- OBTAINING SEPTIC PLANS
- RECORDS AND DATA TO GATHER PRIOR TO ON- SITE INSPECTION

MINIMUM INFO TO REQUEST

- AGE OF HOUSE OR BUILDING
- AGE OF SEPTIC SYSTEM
- # OF OCCUPANTS IN HOUSE

QUESTIONS

- # OF BEDROOMS
- IS THE PROPERTY CURRENTLY OCCUPIED OR HAS IT BEEN VACANT (HOW LONG)
- IN-GROUND SPRINKLER SYSTEM?

QUESTIONS

- DOES THE OWNER KNOW THE LOCATION OF THE SEPTIC TANK AND SYSTEM
- LOCATION OF WELL OR MUNCIPAL WATER SERVICE – WATER LINE
- WHEN WAS THE TANK LAST PUMPED AND BY WHOM – RECORDS

- HAS THE SYSTEM BEEN WORKED ON – FIXED, REPAIRED OR REPLACED
- DOES THE HOUSE HAVE WATER CONDITIONING EQUIPMENT
- IS THERE A PUMP STATION
- IS THERE A GARBAGE DISPOSAL

PLANS

- ARE SEPTIC SYSTEM PLANS AVAILABLE?
- STATE BEGAN REGULATING SEPTICS IN 1967 (IF THE PROPERTY WAS WITHIN 1000 FEET OF SURFACE WATER)
- 1971 IF THE PROPERTY WAS NOT WITHIN 1000 FEET OF SURFACE WATER

PLAN RESEARCH

- SOME TOWNS HAVE RECORDS – BUILDING/ HEALTH DEPT. GOOD PLACE TO START

- NHDES SUBSURFACE BUREAU – JO ANN McKENNY (603) 271-2924
  - NEED TO KNOW THE FOLLOWING INFORMATION:
  - TOWN, STREET, LOT #, OWNER AT TIME HOUSE OR PROPERTY WAS DEVELOPED

RECORDS

- RECORDS SINCE 1986 ARE COMPUTERIZED
- RECORDS PRIOR TO 1986 ARE IN FILE CARDS CATAGORIZED BY TOWN, STREET, OWNER'S NAME, APPROVAL #
- IF FOUND MOST PLANS ARE IN THE STATE ARCHIVE OFFICE AND CAN BE RETRIEVED

INFORM THE CLIENT/ HOMEOWNER

- YOU WILL NEED TO GO INSIDE THE HOUSE, ESPECIALLY THE BASEMENT

- YOU WILL NEED TO DIG SOME HAND-DUG HOLES IN THE YARD, TANK AND SYSTEM AREA
- ASK IF THERE ARE UNDERGROUND WIRES PIPES ETC. IN THE YARD

ON YOUR WAY TO THE SITE

- ARE NEIGHBORS SYSTEMS MOUNDED?

- WHAT IS THE DRAINAGE PATTERN OF THE STREET AS YOU APPROACH THE PROPERTY
  - IS THE PROPERTY IN QUESTION AT THE TOP OF KNOLL OR AT THE BASE OF THE HILL?
  - SLANT OF PAVEMENT – DRAINAGE

INITIAL ON SITE OBSERVATIONS

- TOPOGRAPHY OF PROPERTY FOR DRAINAGE
- WELL LOCATION
- SURFACE WATER OR WETLANDS
- ROOF DRAINS (GUTTERS)

INTERIOR OBSERVATIONS

- LOOK UNDER KITCHEN SINK DISPOSAL?
  - IF SO CURRENT REGULATIONS REQUIRE THAT THE SEPTIC TANK BE INCREASED IN SIZE BY 50%
  - JACUZZI, HOT TUB, POINT OF DISCHARGE
  - BASEMENT SUMP PUMP POINT OF DISCHARGE

ALSO IN THE BASEMENT

- CHECK SEWER PIPES IS THERE ONLY ONE OR MULTIPLE PIPES
- IS THE WASHING MACHINE OUTFALL CONNECTED TO THE MAIN SEWER PIPE, OR IS IT A SEPARATE OUTFALL
- IS THE BASEMENT WET? INDICATOR OF HIGH WATER TABLE

EJECTOR PUMPS

- IS THERE A DOWNSTAIRS BATHROOM OR OTHER FIXTURES WHICH WOULD REQUIRE A EJECTOR (BASIN PUMP)

- CURRENT RULES REQUIRE TANKS IN SERIES OR A 2 COMPARTMENT TANK WHEN USING THESE PUMPS

- ALSO LOOK FOR WHERE GAS LINES, WATER LINES, OTHER UTILITIES ETC LEAVE THE FOUNDATION
- I 888-DIG-SAFE
- ARE THE REPORTED # OF BEDROOMS ACCURATE

IF PLANS ARE AVAILABLE

- DATE OF PLAN - APPROX AGE OF SYSTEM
- APPROVAL # AMENDED PLANS
- DESIGNERS NAME - OPERATIONAL APPROVAL
- TEST PIT AND PERC TEST RESULTS - SOIL DATA

TANK AND D BOX

- HOW MANY GALLONS FOR TANK
- COMPARTMENTS FILTERS
- D BOX LOCATION USE A SCALE RULER
- DESIGN INTENT

FINDING THE TANK

- LOOK ON ROOF FOR STACK VENT PIPE
- REMEMBER WHERE PIPE CAME OUT OF THE BASEMENT
- LOOK FOR DISCOLORED GRASS
- SNOWMELT IN THE WINTER

OTHER CLUES IN FINDING TANK

- SOMETIMES YOU WILL SEE A SLIGHT DEPRESSION OR UNLEVEL GROUND AREA
- THIS IS WHERE TANK WAS PREVIOUSLY DUG UP FOR PUMPING
- USE A ROD OR PROBE TO AID IN FINDING TANK

Standard Soil Probe

Probes are one of the most economical ways to locate buried items. Maximize your profits by minimizing the time spent locating items.

The 3/8" steel rods used in our probes have been carefully selected. We evaluated and performance tested many other types of steel before choosing the one used in all of our probes. This steel provides the greatest durability and extended use. It resists bending (while remaining flexible) and springs back to its original state longer than other steels.

Both the handle and tip are threaded. This allows you to add extensions by using couplers, or to replace the tips after they show significant wear.

The heat-treated tips are designed to provide a small clearance hole for the shaft. This makes the penetration and withdrawal easier because the full length of the shaft is not dragging against the ground.

Smart Stick™ features:

Grips:
- Bright color, easy to see
- Comfortable, smooth, durable vinyl softens impact

Handle:
- Sturdy 1" x 11" solid steel
- Provides additional weight and support for easier penetration
- Big enough to grip with both hands even when wearing gloves

Shaft:
- High quality alloy steel resists bending and bowing
- Threaded for coupler and extension
- The handle and shaft are threaded to ensure a secure connection and ease of replacement

Tip:
- Threaded for replacement
- Special alloy steel
- Heat treated for longer life
- Tapered edges make penetration and withdrawal easier

CAUTION

This PROBE is NOT INSULATED and does not provide protection against electrical shocks. For an insulated probe, buy a Mighty Probe™.

New 3/8" heat-treated. Approximately 20% stiffer. Add $x. See page xx for details.

Note: When ordering your probe with a fiberglass rod, add an 'X' to the part number. E.g. TPA48 becomes TPA48X. This option adds $x to the price of each probe.

Size	Item	Price
36"	TPA36	$xx.xx
42"	TPA42	$xx.xx
48"	TPA48	$xx.xx
54"	TPA54	$xx.xx
60"	TPA60	$xx.xx
66"	TPA66	$xx.xx
72"	TPA72	$xx.xx

*Additional shipping charges apply.

CUT OUT TURF USE PLASTIC

OTHER METHODS

- METAL DETECTORS
- RADIO TRANSMITTERS
- SAFETY DO NOT OPEN INSIDE CLEANOUT FOR PURPOSES OF MEASURING WITH SNAKE OR UNDERGROUND CAMERA

INSPECTING TANK

- OPEN ALL COVERS INLET OUTLET AND CENTER
- CHECK LEVEL OF LIQUID
- IF LEVEL IS SUBSTANCIALLY BELOW OUTLET PIPE THEN TANK IS LEAKING OR IT HAS BEEN RECENTLY PUMPED

- IS THE LEVEL OF LIQUID MUCH HIGHER THAN OUTLET PIPE INDICATOR OF SYSTEM FAILURE
- CONDITION OF BAFFLES
- DO INLET AND OUTLET PIPES LOOK SECURE AND CORRECT DISTANCE TO BAFFLES

COVERS COME IN ALL SHAPES AND SIZES

- HAS CONCRETE SHOWN SIGNS OF DETERORIATION
- ARE BAFFLES INTACT AND IN GOOD SHAPE
- HOW THICK IS THE SCUM LAYER
- HOW THICK IS THE SLUDGE LAYER

DETERIORATED BAFFLE

REPLACEMENT PVC BAFFLE

BACKFLOW FROM SYSTEM

SIZE OF TANK

- WIDTH X LENGTH X DEPTH X 7.48 =

- AGE OF TANKS
  - EARLY TANKS BUILT ON-SITE BLOCKS
  - 1950 STEEL TANKS (SHOULD BE REPLACED)
  - 1967 MIN 750 GAL 1000 GALLON COMMEN
  - 1990 MIN 1000 FOR 2 BEDROOM AND 250 ADDITIONAL FOR EACH + BEDROOM

55 GALLON DRUM

OLD METAL TANK

PUMP STATIONS

- IS THE PUMP STATION VENTED
- IS THE ALARM WORKING AND IS IT WIRED ON A SEPARATE CIRCUIT THAN PUMP
- IS THE PUMP STATION WATERTIGHT
- PROPER RISERS

EDS EFFLUENT DISPOSAL SYSTEM

- OBSERVE SURFACE CONDITIONS
  - LOOK FOR SIGNS OF LUSH GRASS OR EXCESSIVE PLANT GROWTH
  - LOOK FOR SIGNS OF BREAKOUT ODOR

  - FINDING SYSTEM METAL SNAKE FROM TANK OUTLET RADIO TRANSMITTER
  - UNDERGROUND CAMERA
  - PROBES

LUSH GRASS

DURING INSPECTION

AFTER INSPECTION

NOTICE TOP OF D BOX COVER

CESSPOOL

- ONE OF THE OLDEST METHODS OF SEWAGE DISPOSAL SEWAGE FROM HOUSE ENTERS CESSPOOL WITH NO TANK
- THESE WOULD BE PRE 1967 1971

- THESE ARE NOT AN ACCEPTED METHOD OF SEWAGE DISPOSAL AND WOULD NOT QUALIFY FOR IN KIND REPLACEMENT

DRYWELL

- PRECAST CONCRETE STRUCTURE SURROUNDED BY STONES
- ONCE THE BOTTOM BEOMES CLOGGED EFFLUENT ACCUMULATES AND THEN FILTERS THRU THE SIDEWALLS
- TO INSPECT
  - USING A LIGHT AND MIRROR DETERMIME THE HEIGHT OF THE INLET PIPE AND COMPARE THE HIGHEST OBSERVABLE STAIN COMPARE

SEPTIC TANK FIRST THEN DRYWELL

STONE AND PIPE LEACHFIELDS

- DIG INTO THE BACKFILL MATERIAL

  LOOK FOR UNIFORM CHANGE IN COLOR OF THE SOIL IN COMPARISON TO THE NATURAL SOIL COLOR

  - LIGHT GRAY
  - MODERATE GRAY
  - DARK GRAY
  - BLACK

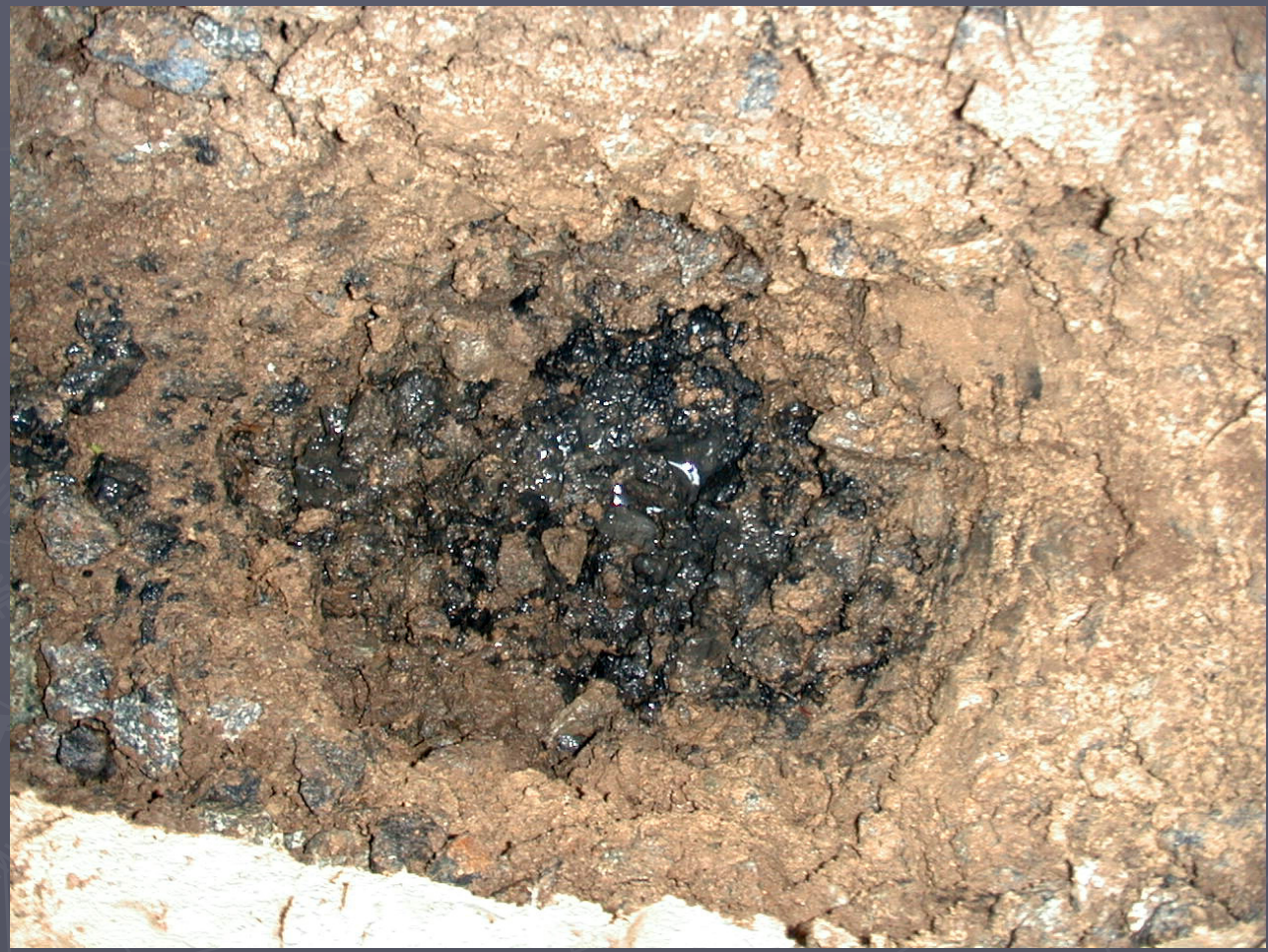
NOTICE THE COLOR CHANGE

SYSTEM SATURATED IN BACKFILL

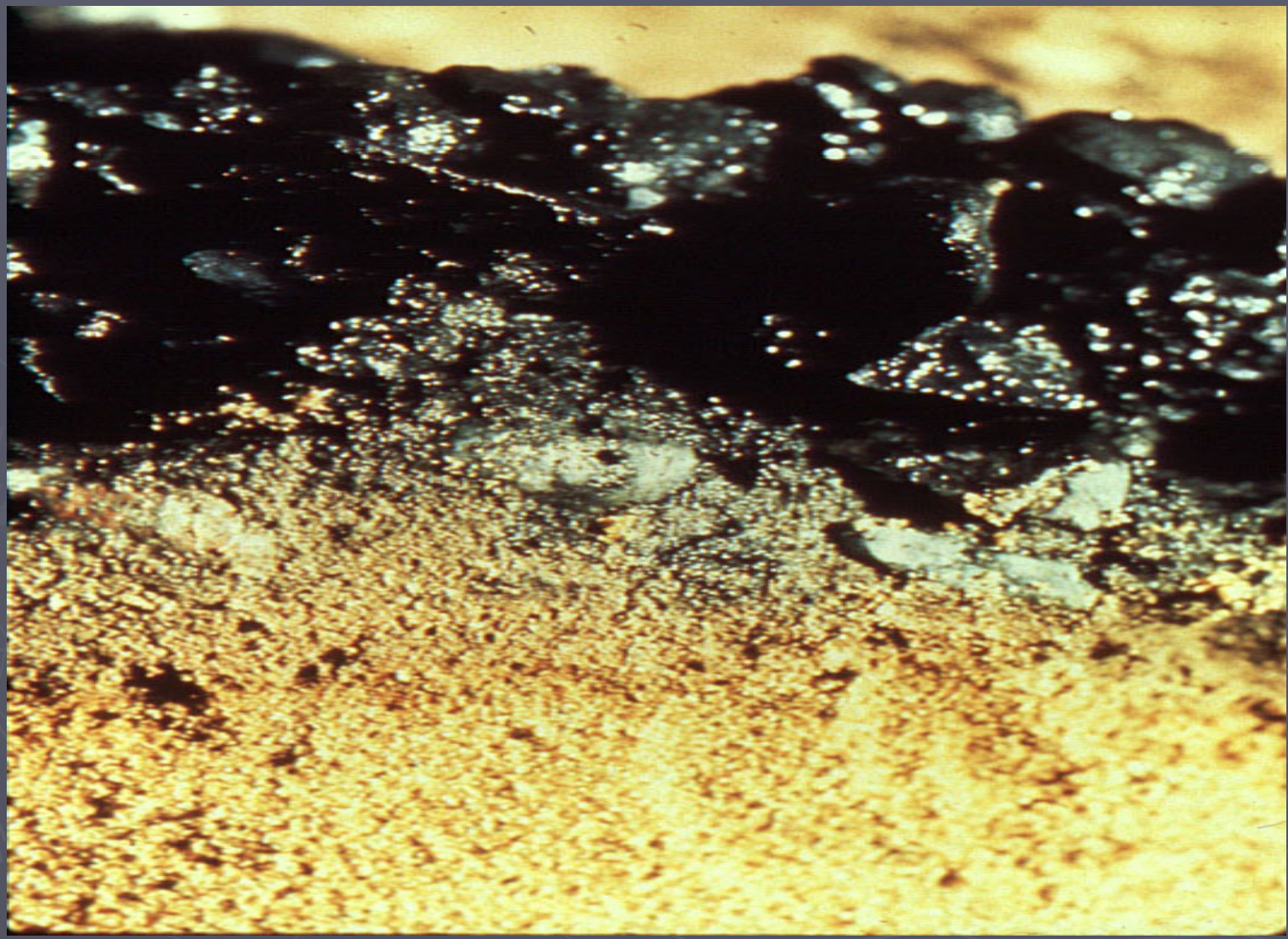
CONDITION OF D BOX

INTO THE STONE

- IS THE STONE SATURATED
- HAS THE STONE CHANGED COLOR TO GRAY TO BLACK – ARE THERE RUST STAINS
- HOW DOES IT LOOK AT THE BASE OF STONE – SOIL INTERFACE
- HOW THICK IS THE BIOMAT



THICK BIOMAT ANEROBIC



STONE AND PIPE BEDS

- GOOD – LITTLE OR NO STANDING EFFLUENT NO SIGNS OF HIGH LIQUID STAINING IN THE D BOX

- FAIR CONDITION – SOME SATURATION OR EFFLUENT STORED IN THE STONE BUT NOT HIGHER THAN THE INVERT OF THE LATERAL PIPES

- POOR CONDITION – STANDING EFFLUENT HIGHER THAN LATERAL INVERTS BUT BELOW TOP OF STONE
- COVER SOIL AND D BOX STAINED

- FAILED – ALL STONE BLACK NO OXYGEN
- EFFLUENT UNDER PRESSURE

CONCRETE CHAMBERS

- GOOD – NO OBSERVED STANDING EFFLUENT
- FAIR – STANDING EFFLUENT ½ WAY UP
- POOR – OVER ½ WAY UP STAINING TO TOP
- FAILED – FULL BLACK SOIL AT BASE

USING MIRROR TO CHECK CHAMBER

CONCRETE CHAMBER FULL

PLASTIC CHAMBERS

ELJEN IN DRAIN

- YOUNG
- NO STANDING EFFLUENT

THE SURRONDING SAND WILL BE GRAY AND MAY BE GRAY NEAR THE PIPE ON TOP OF THE UNITS

EFFLUENT WILL QUICKLY DRAIN WHEN APPLIED

- MIDDLE AGED MORE GRAY COLORS ON THE TOP EFFLUENT DRAINS SLOWER

- OLD UNIT HAS TURNED ANAEROBIC
- BLACK COLORS ARE PRESENT
- STANDING EFFLUENT PRESENT

ELJEN IN DRAIN

ELJEN IN DRAIN

CONDITIONS PARALLEL

- GOOD – UNITS LOOK YOUNG NO STANDING EFFLUENT
- FAIR – LESS THAN ½ OF UNITS SHOW SIGNS OF AGING ,EFFLUENT RETENTION OR BLACK COLORS
- POOR – SLOW DRAINING STANDING EFFLUENT BLACK COLORS
- FAILED – ALL UNITS FULL BLACK COLORS

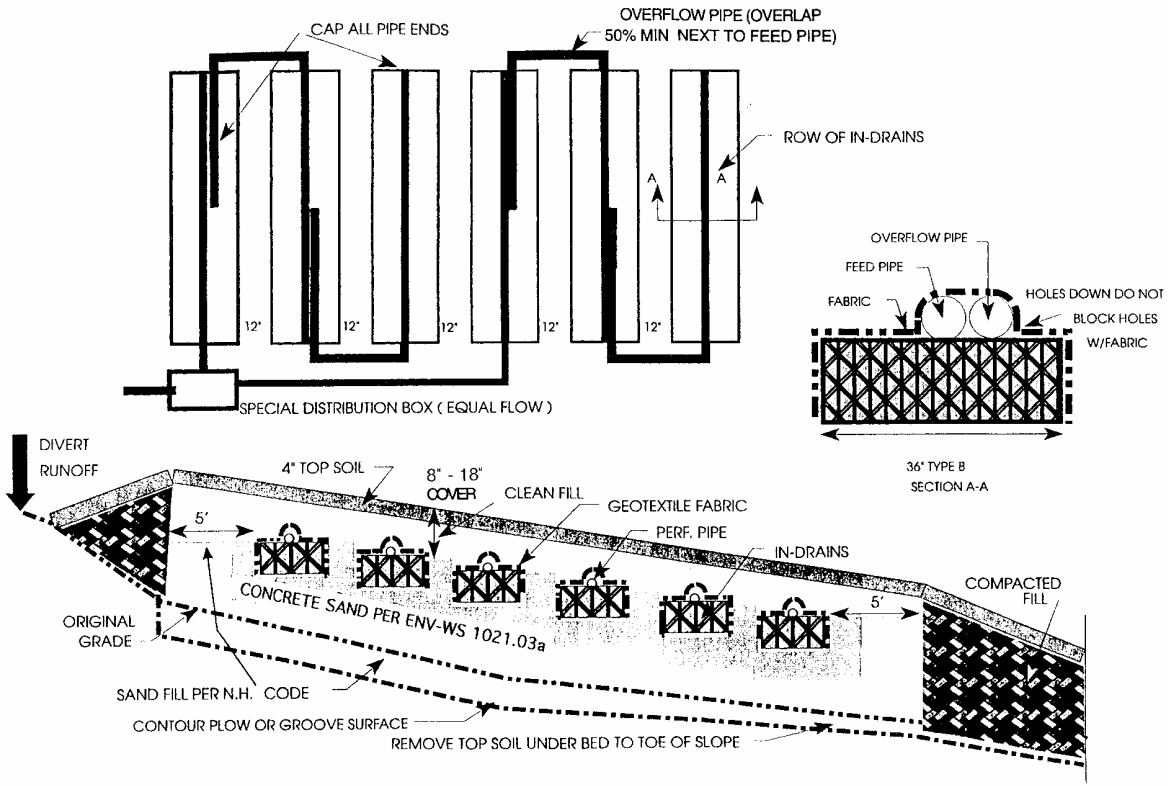


FIGURE 6. RAISED BED ON SLOPE WITH SERIAL DISTRIBUTION AND DISTRIBUTION BOX FOR > 900 GAL/ DAY

SERIAL

- GOOD – ONLY THE FIRST PART LOADED SIGNS OF AGING IN LESS THAN ONE ¼ OF TOTAL UNITS NO SIGNS IN LOWER ROWS
- FAIR – UPPER ROW LOADED EFFLUENT PASSING TO LOWER ROWS
- POOR – ALL UPPER ROWS FULL EFFLUENT AT LOWER ROW

- FAILING PARELLEL OR SERIAL
- ALL UNITS FULL
- BLACK COLORS SURROND ALL UNITS
- EFFLUENT MAY SURFACE OR BACK UP INTO THE STRUCTURE

FABRIC WRAPPED TUBES

- PRESBY ENVIROSEPTIC
- GEO FLOW
- COULD BE INSTALLED PARALLEL (LEVEL)
- OR SERIAL (SLOPING SYSTEM)

PARALLEL

- GOOD – LITTLE STANDING EFFLUENT THE LOWER QUARTER OF RECEIVING SAND WILL BE GRAY NO BLACK COLORS OBSERVED
- FAIR – ½ WAY UP SAND IS TURNING GRAY
- POOR – TUBES ARE MORE THAN ½ FULL TO INVERTS BLACK COLORS PROMINENT IN THE RECEIVING SAND
- FAILING – TUBES ARE FULL SOIL ALL BLACK

SERIAL DISTRIBUTION

SERIAL

- GOOD – ¼ OF TUBES HAVE EFFLUENT
- FAIR – ½ OF THE TUBES HAVE EFFLUENT
- POOR – BLACK COLORS IN THE SOIL SURRONDING TUBES TUBES FULL
- FAILING – SURFACING OR BREAKOUT

N.H. DES SUBSURFACE SYSTEMS BUREAU
REPAIR / REPLACEMENT REPORT - Env-Wq 1003.10(c)
FILE PRIOR TO UNDERTAKING WORK

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Date: _____

Designer: Name: _____ Permit Number: _____
Address: _____
Daytime Telephone Number: _____ Email Address: _____
Fax Number: _____

Installer: Name: _____ Permit Number: _____
Address: _____
Daytime Telephone Number: _____ Email Address: _____
Fax Number: _____

Owner: Name: _____
Address: _____
Daytime Telephone Number: _____ Email Address: _____
Fax Number: _____

Lot and System Information:
Town: _____ Street: _____
Tax Map No: _____ Lot No: _____
State Approved System? YES ☐ NO ☐ Construction Approval Number: _____
Percolation Test: Not Required
Test Pit Date: _____ Test Pit No.: _____ **ATTACH TEST PIT RESULTS**

To see if the ISDS qualifies for repair/replacement, answer the following questions:

1. Does the ISDS serve a commercial building? YES ☐ NO ☐
2. Is the EDA within 75 feet of any surface water or water supply well? YES ☐ NO ☐
3. Is the EDA bottom less than 24 inches above the seasonal water table? YES ☐ NO ☐
4. Any change to dimensions, location, depth, or type of design? YES ☐ NO ☐
5. Any change in use? YES ☐ NO ☐
6. Any increase in flow? YES ☐ NO ☐

IF YOU ANSWERED "YES" TO ANY OF THE ABOVE QUESTIONS, THE SEPTIC SYSTEM DOES NOT QUALIFY for repair/replacement of existing systems under Env-Wq 1003.10.

Signatures: **BY SIGNING, I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE, COMPLETE, AND NOT MISLEADING TO THE BEST OF MY KNOWLEDGE AND BELIEF.**

Installer: _____ Permit No.: _____ Date: _____

Designer: _____ Permit No.: _____ Date: _____

CONDITIONS: Completed Repair/Replacement Questionnaire and sketch MUST be submitted within 10 days of completion of the project.

Contact Information: NHDES, Subsurface Systems Bureau, 29 Hazen Drive, Concord, NH 03302
Telephone: (603) 271-3501 Fax: (603) 271-6683

N.H. DES SUBSURFACE SYSTEMS BUREAU
REPAIR/REPLACEMENT QUESTIONNAIRE - Env-Wq 1003.10(i) and (*l*)
SUBMIT WITHIN 10 DAYS OF COMPLETING WORK

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Date Work Completed: _____

Designer: Name: _____ Permit Number: _____
Address: _____
Daytime Telephone Number: _____

Installer: Name: _____ Permit Number: _____
Address: _____
Daytime Telephone Number: _____

Owner: Name: _____ Daytime Telephone Number: _____
Address: _____

Lot Location:
Town: _____ Street: _____
Tax Map No: _____ Lot No: _____

Water Supply (check one): ☐Individual ☐Community ☐Municipal (Name: _____)

# of Occupants (check one): ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐More than 6 (#:_____)

# of Bedrooms (check one): ☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐More than 6 (#:_____)

Household Items (check all that apply): ☐Garbage Grinder ☐Washing Machine ☐Chlorinator
☐Dishwasher ☐Jacuzzi/Hot Tub ☐Water Softener ☐ Solids pump unit before septic tank
☐Other: _____

Sewage Disposal System (ISDS)

Effluent Disposal (check all that apply):
☐ In-ground ☐ Raised ☐ Pressure Distribution
☐ Trenches ☐ Leachfield ☐ Drywell
☐ Pipe-and-stone ☐ Chambers ☐ Large diameter graveless pipe
☐ Other (specify) _____

Age of System: _____ years

Septic Tank: Old/Existing: Size: _____ gallons Type: _____
New (if applicable): Size: _____ gallons Type: _____
Average time between pumping of Septic Tank: _____ years **OR** ☐Tank never pumped

Opinion as to why repair/replacement was needed:
☐ Age ☐ Excessive load (volume) ☐ Inappropriate load (chemicals, *etc.*)
☐ Other: _____

ATTACH SKETCH REQUIRED BY ENV-WQ 1003.10(i) - (k), SIGNED BY PERMITTED DESIGNER

Signature: **BY SIGNING, I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE, COMPLETE, AND NOT MISLEADING TO THE BEST OF MY KNOWLEDGE AND BELIEF.**

Installer: _____ Permit No.: _____ Date: _____

Contact Information: NHDES, Subsurface Systems Bureau, 29 Hazen Drive, Concord, NH 03302
Telephone: (603) 271-3501 Fax: (603) 271-6683

GSDI CERTIFIED SEPTIC SYSTEM EVALUATION PROGRAM

- MAY 13 & 17, 2008 – ROCHESTER, NH
- 603-228-1231
- WWW.CERTIFIEDSEPTICEVALUATOR.ORG
- WWW.GSDI.ORG